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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,780	02/12/2002	Sung-Joo Yoo	18062C-39.10US	1045

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EXAMINER

BELLO, AGUSTIN

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 03/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/075,780

Applicant(s)

YOO, SUNG-JOO

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donald (U.S. Patent No. 6,415,074) in view of Chang (U.S. Patent No. 6,160,651) and Jones (U.S. Patent No. 6,281,998).

Regarding Claim 1 and 6, Donald teaches receiving a multiplexed baseband optical signal at an input port of an optical circulator (reference numeral 12 in Figure 2), applying the multiplexed baseband optical signal via an extraction port of the optical circulator to a filter (reference numeral 10 in Figure 2); optically separating a wavelength via the filter, and directing the wavelength to an optical energy transducer while reflecting the modulated optical carrier back to the extraction port of the optical circulator (as seen in Figure 2 and 9A); and outputting the modulated optical carrier to an output port of the optical circulator (as seen in Figure 2). Donald differs from the claimed invention in that Donald fails to specifically teach that the extracted optical signal is an optical subcarrier signal and that the filter element used comprises a Bragg grating. However, Donald suggests that the extracted signal could comprise a subcarrier signal in that Donald teaches that the system is usable in an IP network wherein IP protocols (i.e. headers which are usually subcarriers) are carried over a control channel (reference numeral 6 in Figure 1, i.e. the subcarrier) in order to control routing of a plurality of wavelengths.

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Furthermore, Chang, in the same field of endeavor, teaches that it is well known in the art to extract a subcarrier in an IP network for information regarding routing of a wavelength carrying signal (column 10 lines 1-14). Regarding the use of a fiber Bragg grating as the filter element, Jones teaches that it is well known in the art to use a fiber Bragg grating as a wavelength filtering element to extract a wavelength from a plurality of wavelengths (Figure 10 column 12 lines 50-65). One skilled in the art would clearly have recognized that it would have been possible to use a fiber Bragg grating as the filter of Donald in order to extract a single wavelength being that the filter of Donald and the filter element of Jones both produce the same result, i.e. the extraction of a single wavelength or subcarrier. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have extracted a subcarrier as taught by Chang and suggested by Donald via the system of Donald using a fiber Bragg grating as taught by Jones.

Regarding Claim 2, the combination of references teaches outputting a modulated electrical signal from the optical transducer which is proportional to modulation of the modulated optical signal; and detecting the information modulating the electrical signal (i.e. Chang column 11 lines 64-67, the receiver of Donald Figure 9A).

Regarding Claims 3 and 8, the combination of references teaches separating the modulated optical carrier from the modulated optical subcarrier according to the method of claim 1; and applying the modulated optical carrier to an optical modulator adapted for writing new subcarrier modulated control information (Chang column 20 lines 21-26, column 22 lines 14-21, 58-67).

Regarding Claim 7, the combination of references teaches an optical energy transducer that is a photodetector for generating a electrical signal proportional to the signal of the

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modulated subcarrier and further including: a detector for detecting the information modulating the electrical signal (reference numeral 1610, 1623, and 1691 in Figure 18 of Chang).

3. Claims 4-5 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donald in view of Chang, Jones, and Sasayama (U.S. Patent No. 5,506,712).

Regarding Claim 4 and 9, the combination of Donald, Chang, and Jones teaches receiving the signal at the input to a routing element; extracting the modulated optical subcarrier control information according to the method of claim 2 (as discussed above); and directing the optical carrier for the payload along one of a plurality of output paths from the routing element responsive to the control information (inherent in the IP routing of the system of Donald and Chang). The combination of Donald, Chang, and Jones differs from the claimed invention in that it fails to specifically teach changing the wavelength of the optical carrier for the payload in response to the control information. However, Sasayama teaches that it is well known in the art to use a header containing control information to change the wavelength of an optical carrier (Figure 6). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have used the control information contained in the header of the combination of Donald, Chang, and Jones to change the wavelength of the optical carrier for the payload in response to the control information.

Regarding Claim 5, the combination of Donald, Chang, Jones, and Sasayama teaches the method according to claim 4 further comprising the step of modulating the directed optical carrier to add a subcarrier containing new control information (as discussed regarding claim 3 above).

Regarding Claim 10, the combination of references teaches that the optical source comprises a tunable laser, but differs from the claimed invention in that it fails to specifically teach that the tunable laser is optically coupled to a semiconductor optical amplifier. However, one skilled in the art would clearly have recognized that it would have been beneficial to amplify the wavelength converted optical signal in order to counteract signal degradation. It is well known in the art to amplify a signal in order to counteract the effects of signal degradation in an optical system. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have amplified the optical signal output from the tunable laser via a semiconductor optical amplifier in order to counteract the effects of signal degradation.

4. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donald in view of Chang, Jones, Sasayama, and Gehler (U.S. Patent No. 6,400,872).

Regarding Claims 11 and 12, the combination of Donald in view of Chang, Jones, and Sasayama differs from the claimed invention in that it fails to specifically teach a switch coupled to the tunable source and adapted for directing any of its inputs to a specific output according to the wavelength of the input signal. However, such switches are very well known in the art and are known to provide efficient switching of signals in an all-optical domain. Gehler, teaches such a switch in the form of an arrayed waveguide grating which is capable of directing any of its inputs to a specific output according to the wavelength of the input signal. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have coupled an arrayed waveguide grating to the tunable source in order to allow efficient switching of wavelengths according to the wavelength of the input signal.

Regarding Claim 13, the combination of Donald in view of Chang, Jones, Sasayama, and Gehler differs from the claimed invention in that it fails to specifically teach an array of optical modulators coupled to the outputs of the wavelength switch for modulation of additional information onto the modulated optical carrier. However, modulation of signals is very well known in the art and would have provided a means for transmission of additional information in the system of the combination of references. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have coupled an array of optical modulators to the outputs of the wavelength switch for modulation of additional information onto the modulated optical carrier to allow for the transmission of additional information.

Response to Arguments

5. Applicant's arguments filed 12/26/02 have been fully considered but they are not persuasive. The applicant argues that the combination of Donald and Chang would not have obviated the claimed invention. However, the examiner disagrees. Donald clearly states that although his system is particularly suited to system that use a plurality of channels on the same fiber, a description that clearly describes the signal format of the claimed invention. Furthermore, Donald states that the present invention is also compatible with other multi-channel configurations not limited to WDM or DWDM constraints. Moreover, it is well known that subcarriers are low frequency signals added to an optical signal (in the optical domain). Being that the subcarriers themselves are of a specific frequency, it is clear that the frequency tunable filter of Donald could have been tuned to the low frequency of the subcarrier, thereby allowing the subcarrier to be extracted or separated from the optical signal. Donald clearly would have suggested that subcarriers are used in his system being that each IP client in the system has the

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ability to send IP protocols over a control channel, thereby suggesting the use of a subcarrier headers which are known to be used to carry such control information in an IP environment. Chang clearly supports that IP control information carried in a header can be added to an optical signal by use of a subcarrier (column 20 lines 5-6), a subcarrier and header which can be extracted by the device of Donald.

6. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

7. In response to applicant's arguments, the recitation of an optical subcarrier of a subcarrier multiplexed baseband optical signal, the subcarrier multiplexed baseband optical signal comprising a modulated optical carrier for a payload and a modulated optical subcarrier for control information, the modulated optical subcarrier being at a subcarrier frequency which is separated from the modulation bandwidth of the optical carrier has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*,

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535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mizrahi teaches an optical circulator and a grating.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB

March 9, 2003



JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600